



SSL Insight Certificate Installation Guide

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Introduction

A prerequisite for configuring A10 Networks Thunder® SSL Insight® (SSLi®) solution is generating a Certificate Authority (CA) certificate with a known private key which will be used to re-sign the original server certificate when the client initiates an SSL session to the server. This CA certificate must be trusted by the internal users, or it must be signed by an own/local root CA trusted by the users. Otherwise, internal users will see an SSL “untrusted root” error whenever they try to connect to an SSL-enabled website.

This guide assumes a scenario where you have a local root CA and it issues (or signs) an intermediate CA certificate for an SSL Insight deployment. Also, the root CA certificate needs to be distributed and installed as Trusted Authority onto the internal client machines. This guide includes the following contents of SSL certificate installation:

- Generating CA certificates for SSL Insight
- Importing a CA certificate and certificate chain onto the A10 Thunder SSLi device
- Installing a certificate in Microsoft Windows 7 for Microsoft Internet Explorer
- Installing a certificate in Google Chrome
- Installing a certificate in Mozilla Firefox

Generating CA Certificates for SSL Insight

The SSL Insight feature relies on a CA certificate and key pair to decrypt traffic between clients and any external SSL servers that are not controlled by the same organization. When an internal user initiated the SSL communication with an external server, the A10 Thunder SSLi device intercepts the server certificate from the original server, modifies the certificate and then re-signs it using the CA certificate. The forged server certificate is then sent to the internal user as a server certificate of the original server.

In the following example, a Linux server with an OpenSSL package installed is used as a root Certificate Authority (CA), and creates the root CA certificate. For SSL Insight use, Thunder SSLi generates a CSR to create an intermediate CA certificate which must be signed by root CA. Once generated, both intermediate CA certificate and CA certificate chain need to be imported onto the Thunder SSLi device.

1. Create a root pair (certificate and key) on root CA/Linux Server.

This step shows how to create a root CA certificate and private key using OpenSSL on a Linux server. You can skip this if you already have own root CA.

```
# openssl genrsa -aes256 -out private/ca.key.pem 4096
# openssl req -config openssl.cnf -key private/ca.key.pem -new -x509 -days
7300 -sha256 -extensions v3_ca -out certs/ca.cert.pem
Enter pass phrase for private/ca.key.pem:
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a
DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:US
State or Province Name [Some-State]:CA
Locality Name []:
Organization Name [Internet Widgits Pty Ltd]:A10 Lab
Organizational Unit Name []:SSLi Test
Common Name []:A10 Lab Root CA
Email Address []:
```

Note: X509 v3_ca extension includes the following. For more details, refer <https://jamielinux.com/docs/openssl-certificate-authority/index.html>

```
basicConstraints = critical, CA:true
keyUsage = critical, cRLSign, keyCertSign
subjectKeyIdentifier=hash
```

2. Create a private key and a CSR on the Thunder SSLi device.

This is an example of how to create a private key and generate a CSR for intermediate CA certificate on the Thunder SSLi device.

```
ThunderSSLi(config)# pki create csr ssli-ca.key use-mgmt-port scp://<IP
address of your Linux server>/folder_path/ssl-ca.csr
```

```
User name []?
```

```
Password []?
```

```
input key bits(1024,2048,4096) default 1024:2048
```

```
input Common Name, 1~64:A10 SSLi Demo CA
```

```
input Division, 0~31:
```

```
input Organization, 0~63:A10 Lab
```

```
input Locality, 0~31:
```

```
input State or Province, 0~31:CA
```

```
input Country, 2 characters:US
```

```
input email address, 0~64:
```

Note: You can also create an intermediate pair (key and CA certificate) on your root CA without using CSR with Thunder SSLi.

3. Sign the CSR and create an intermediate CA certificate on root CA/Linux server.

This is an example of signing the CSR and creation of an intermediate CA certificate on root CA.

```
# openssl ca -config openssl.cnf -extensions v3_intermediate_ca -days 3650
-notext -md sha256 -in csr/ssl-ca.csr -out newcerts/ssl-ca.cert.pem
```

```
Using configuration from openssl.cnf
```

```
Enter pass phrase for /root/ca/private/ca.key.pem:
```

```
Check that the request matches the signature
```

```
Signature ok
```

```
Certificate Details:
```

```
Serial Number: 4099 (0x1003)
```

```
Validity
```

```
Not Before: May 26 01:41:10 2016 GMT
```

```
Not After : May 24 01:41:10 2026 GMT
```

```
Subject:
```

```
countryName = US
```

```
stateOrProvinceName = CA
```

```
organizationName = A10 Lab
```

```
commonName = A10 SSLi Demo CA
```

```
X509v3 extensions:
```

```
X509v3 Subject Key Identifier:
```

```
75:78:9B:F1:A1:20:BD:7C:B3:5D:C6:2E:B3:AF:34:77:4D:5C:6C:2B
```

```
X509v3 Authority Key Identifier:
```

```
keyid:07:28:03:E3:B8:D1:EB:4F:17:05:FC:27:3C:D2:A8:74:F9:F2:C4:E9
```

```
X509v3 Basic Constraints: critical
```

```
CA:TRUE, pathlen:0
```

```
X509v3 Key Usage: critical
```

```
Digital Signature, Certificate Sign, CRL Sign
```

```
Certificate is to be certified until May 24 01:41:10 2026 GMT (3650 days)
```

```
Sign the certificate? [y/n]:y
```

```

1 out of 1 certificate requests certified, commit? [y/n]y
Write out database with 1 new entries
Data Base Updated

```

4. (Optional) Create the certificate chain.

This is an optional step required only if your intermediate CA certificate for SSLi is signed by another trusted intermediate CA instead of a root CA. In this case, a CA certificate chain is required to complete the chain of trust when an application verifies the server certificate signed by the intermediate CA which is not directly signed by root CA. The CA certificate chain can be created by concatenating the intermediate CA certificates from the one for SSL Insight up to the one signed by the root CA. If the intermediate CA certificate for SSLi is signed by the root CA, you don't need to create a certificate chain, as the user should have the root CA certificate as a trusted authority.

For example, If the `ssli-ca.cert.pem` is signed by an intermediate CA (`int-ca.cert.pem`) which is signed by root CA, the certificate chain should include two certificate except root CA (`ca.cert.pem`).

```

root CA (ca.cert.pem)
  |
  +----- Int. CA (int-ca.cert.pem)
            |
            +----- SSLi CA cert (ssli-ca.cert.pem)
# cat newcerts/ssli-ca.cert.pem certs/int-ca.cert.pem > newcerts/ssli-ca-
chain.cert.pem

```

Note: You can also include root CA into the certificate chain but is not necessary.

Importing a CA Certificate and Certificate Chain onto the A10 Thunder SSLi Device

Once the intermediate CA and certificate chain are ready, you can import both as a certificate type onto the Thunder SSLi device for SSLi use. Since CSR is used, the private key (`ssli-ca.key`) is already on the Thunder SSLi.

```

#import cert ssli-ca.cert.pem certificate-type pem use-mgmt-port scp://<IP
address>/path/ssli-ca.cert.pem
#import cert ssli-ca-chain.cert.pem certificate-type pem use-mgmt-port
scp://<IP address>/path/ssli-ca-chain.cert.pem

```

Note: If you created a private key along with the intermediate CA certificate, you can export them in PKCS12 format on CA root server, and import it as `pfx` type on the Thunder SSLi.

Once certificates are imported, you can configure them as forward-proxy certificate in the `client-ssl` template. Please note that the intermediate CA "`ssli-ca.cert.pem`" is used for both the CA certificate and certificate chain as it's signed by the root CA.

```

ThunderSSLi (config)#slb template client-ssl cSSLi
ThunderSSLi (config-client ssl)#forward-proxy-ca-cert ssli-ca.cert.pem
ThunderSSLi (config-client ssl)#chain-cert ssli-ca.cert.pem
ThunderSSLi (config-client ssl)#forward-proxy-ca-key ssli-ca.key
ThunderSSLi (config-client ssl)#forward-proxy-enable
ThunderSSLi (config-client ssl)#sh context
!
ThunderSSLi configuration: 172 bytes
!
slb template client-ssl cSSLi
  chain-cert ssli-ca.cert.pem
  forward-proxy-ca-cert ssli-ca.cert.pem
  forward-proxy-ca-key ssli-ca.key
  forward-proxy-enable
!

```

Note: In case a certificate chain is required, use the following command instead:

```

ThunderSSLi (config-client ssl)#chain-cert ssli-ca-chain.cert.pem



```

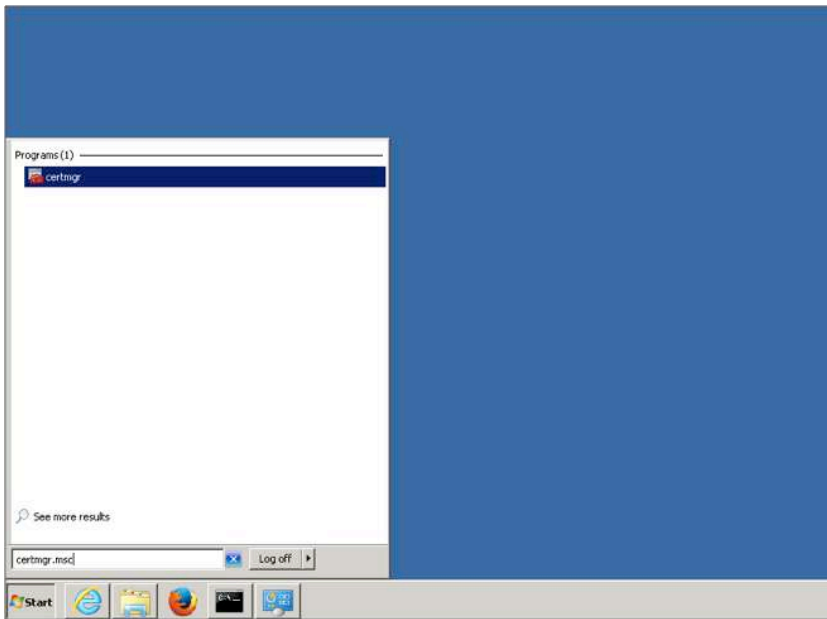
The root CA certificate must be imported as a Trust Authority onto the client machines. This can be done manually or by using an automated service such as Microsoft Group Policy Manager.

Note: Further details for Group Policy Manager can be found at: <http://technet.microsoft.com/en-us/library/cc772491.aspx>

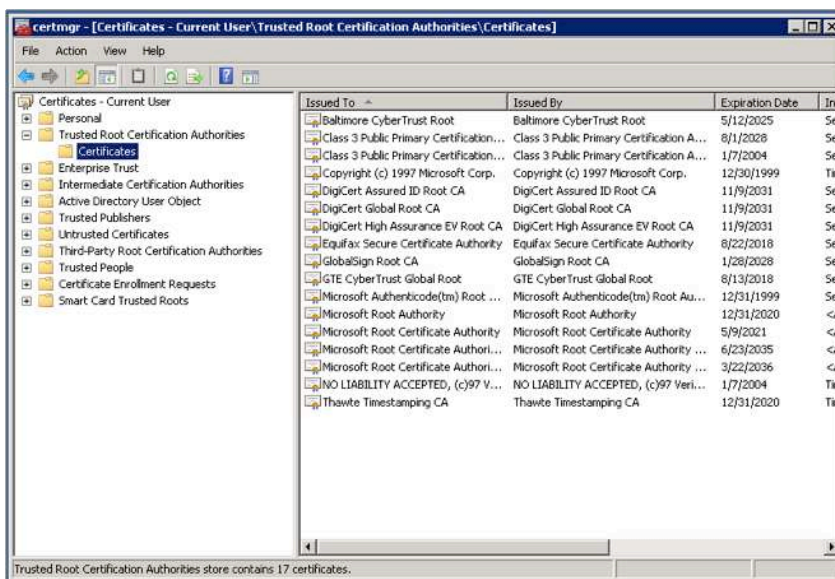
Installing a Certificate in Microsoft Windows 7 for Internet Explorer

The following will guide you through the steps required for importing the root CA certificate into your Windows 7 computer. You must be logged on as an administrator to perform these steps and the root CA certificate should have been imported onto your computer already.

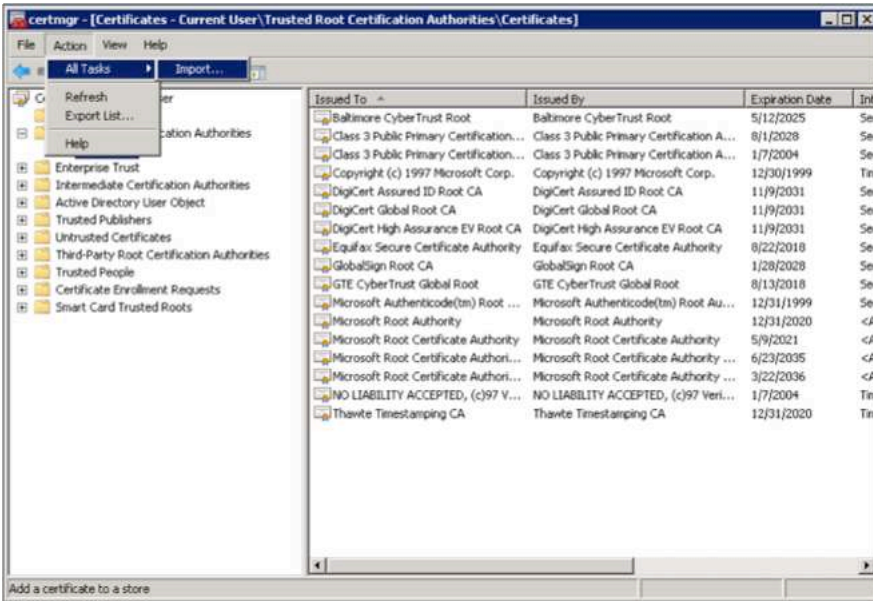
1. Open Certificate Manager by clicking the Start button , typing **certmgr.msc** into the search box, and then pressing Enter.  If you're prompted for an administrator password or confirmation, type the password or provide confirmation.



2. In **Certificate Manager**, select the folder that you want to import the certificate into. In this exercise, we have selected the folder: **Trusted Root Certification Authorities > Certificates**.



- Click the **Action** menu, point to **All Tasks**, and then click **Import**.

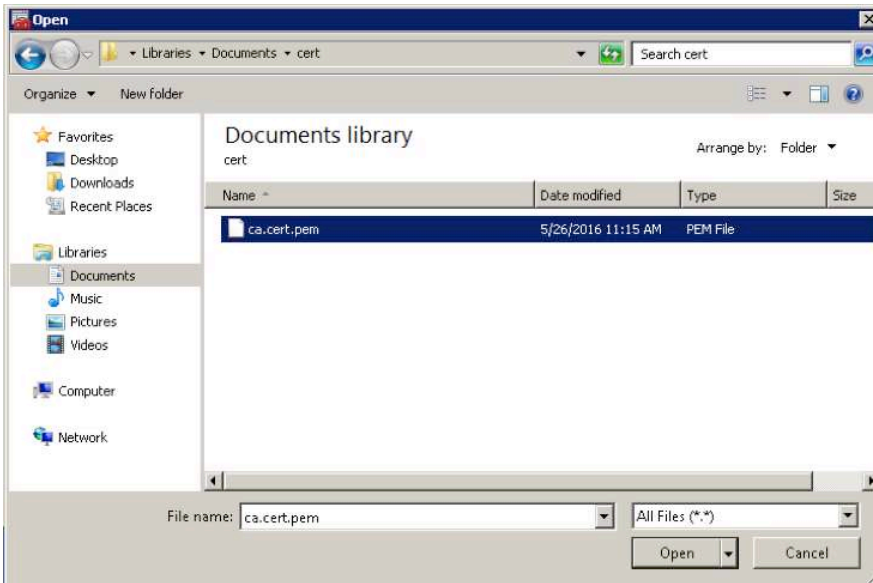


- In Certificate Import Wizard, click **Next** to proceed to the File Import page.

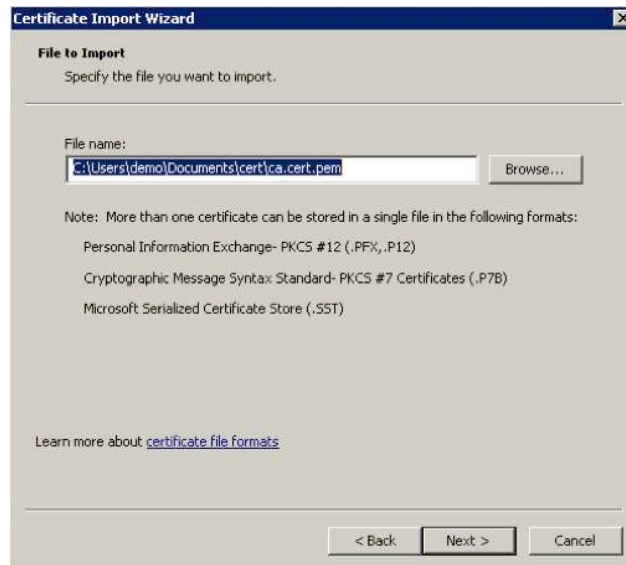


5. Select **Browse** to locate the certificate file that is to be imported.

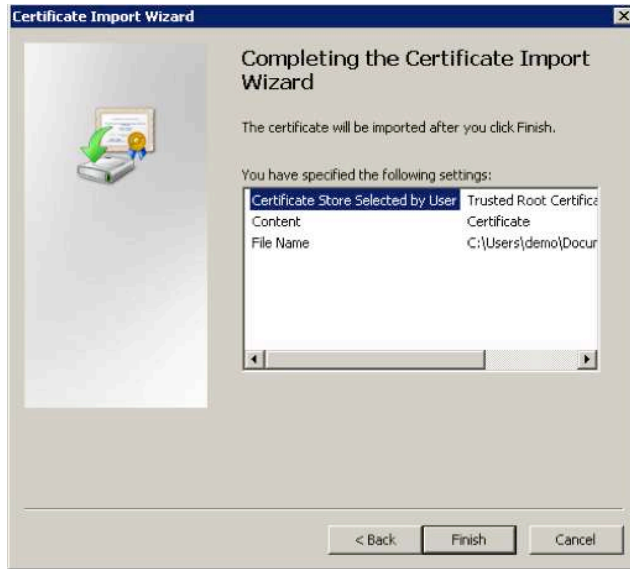
Note: the *Open* dialog box only displays X.509 certificates by default. If you want to import another type of certificate, select the certificate type you want to import in the *Open* dialog box and click **Open**.



6. Click the **Next** button.



7. Click the **Next** button.



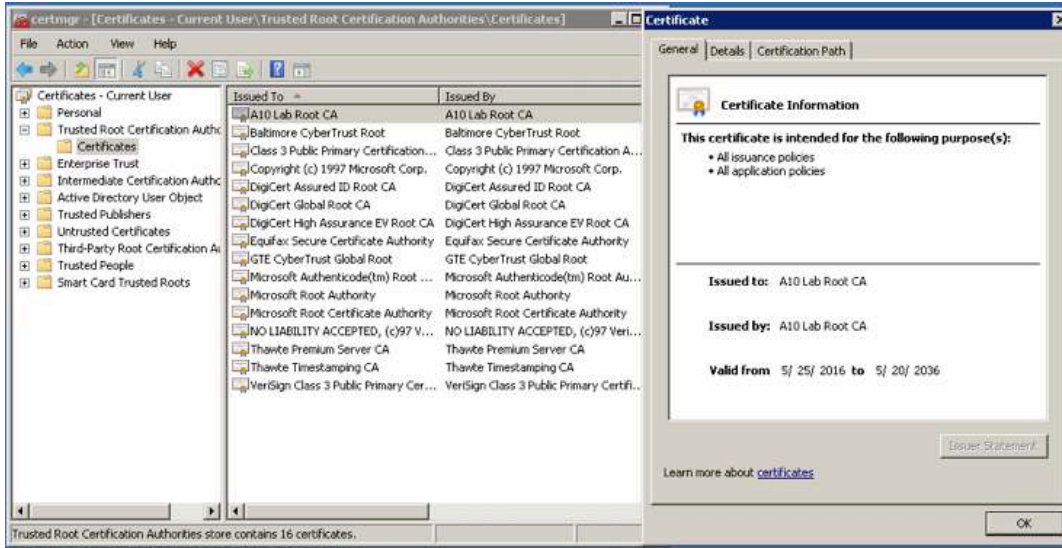
8. Confirm your selections and click **Finish**.



9. In the **Security Warning** popup, select **Yes**, since you made an informed decision to import this certificate.

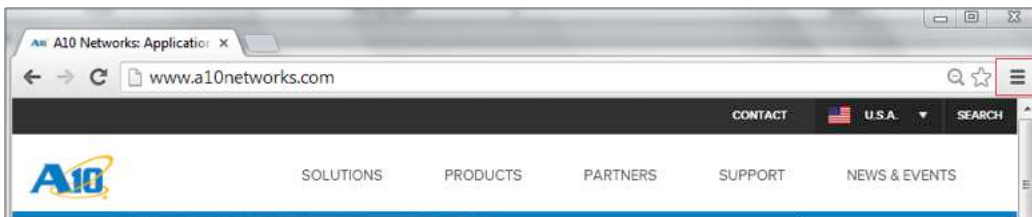
10. If the import is successful, you will see a dialog box with the message “**The import was successful.**”

11. You can see the newly installed CA certificate under the specified folder.

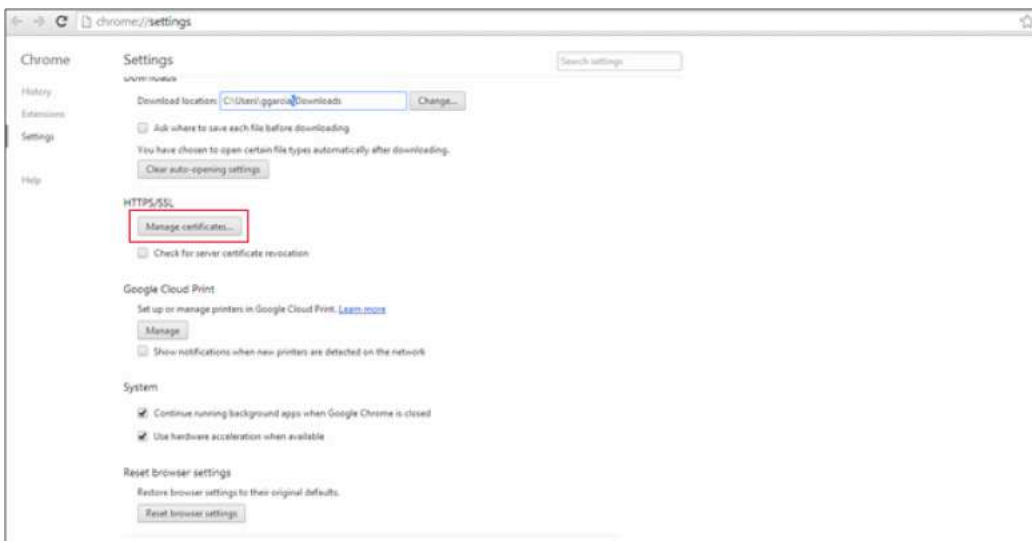


Installing a Certificate in Google Chrome

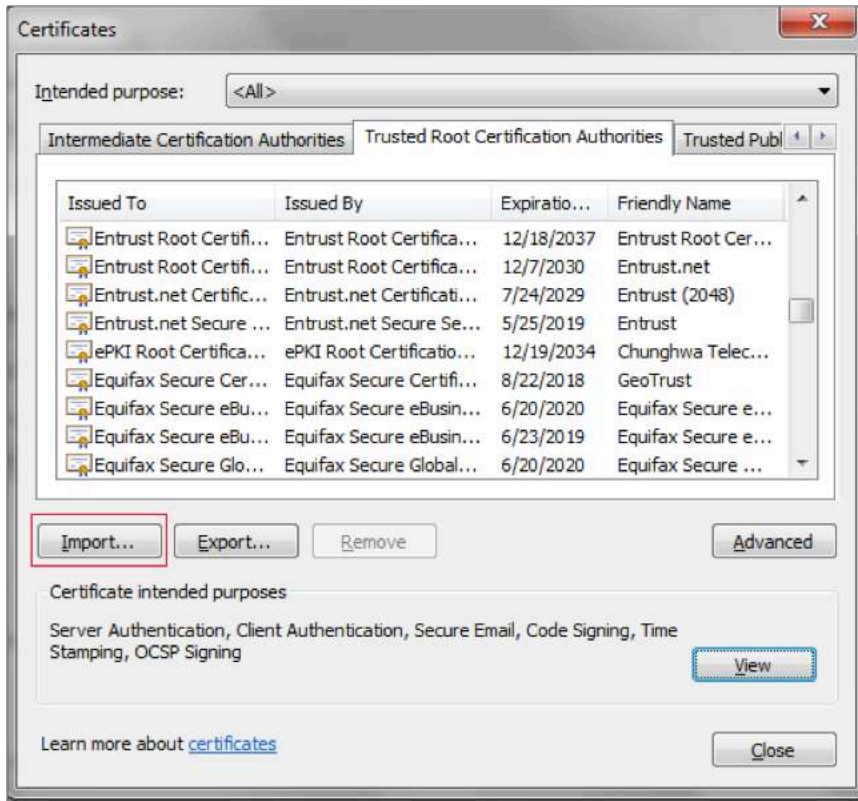
1. To install the CA certificate on Google Chrome, open the Chrome browser.
2. Click the “Customize and Control Google Chrome” option located on the right hand corner of the browser window.



3. Navigate to the HTTPS/SSL section of Chrome Settings and click the **Manage certificates** button.



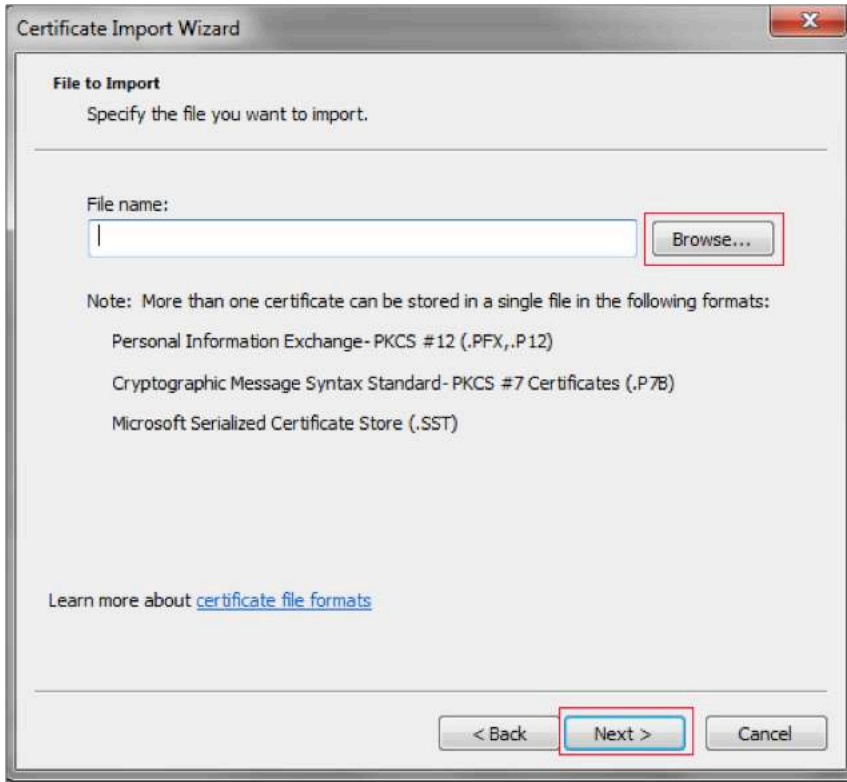
- In the certificate folder on the **Trusted Root Certification Authorities** tab, click the **Import** button and a **Certificate Import Wizard** will appear.



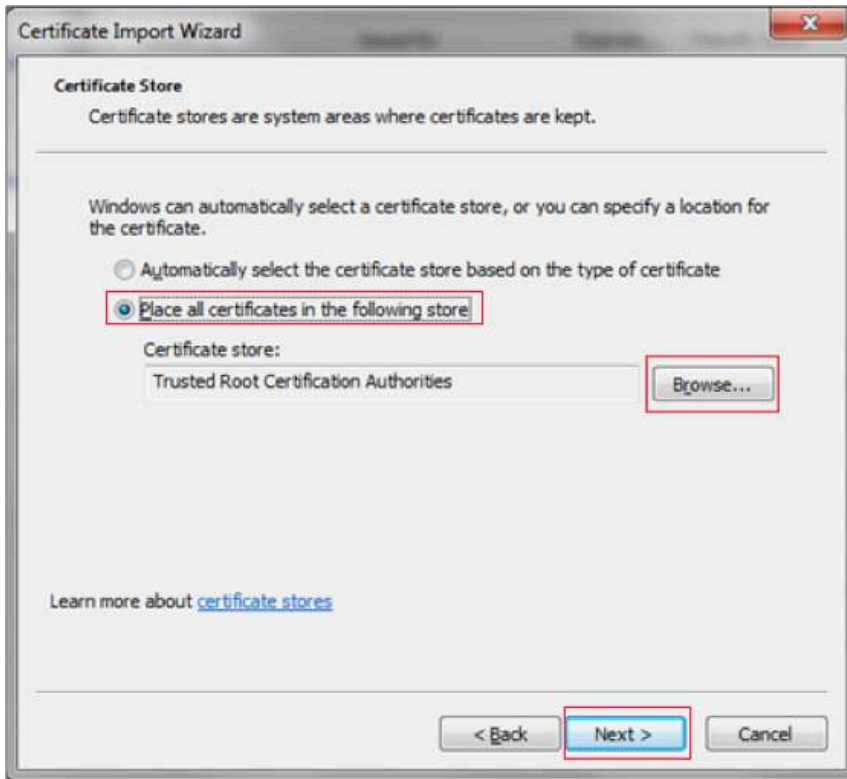
- In the Certificate Import Wizard, click the **Next** button.



6. Click the **Next** button to browse to the location of the CA certificate.



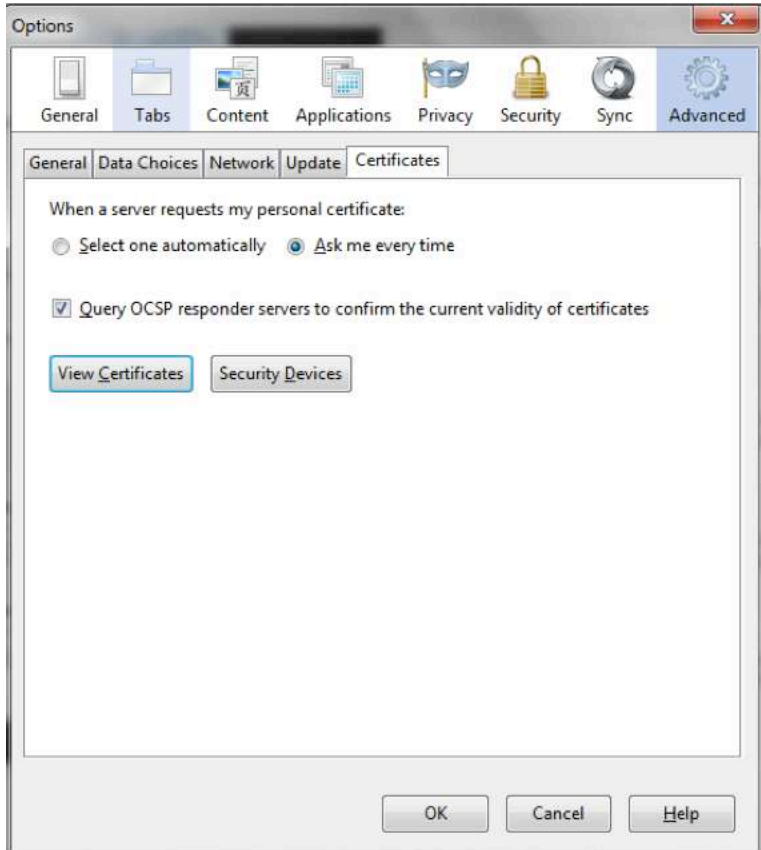
7. Once the correct certificate has been located, click **Next** to install the certificate in the "Trusted Root Certificate Authorities" certificate store. Click **Next** and **Finish** and then click **OK**. You will see a Security Warning pop-up, select Yes, since you made an informed decision to import this certificate.



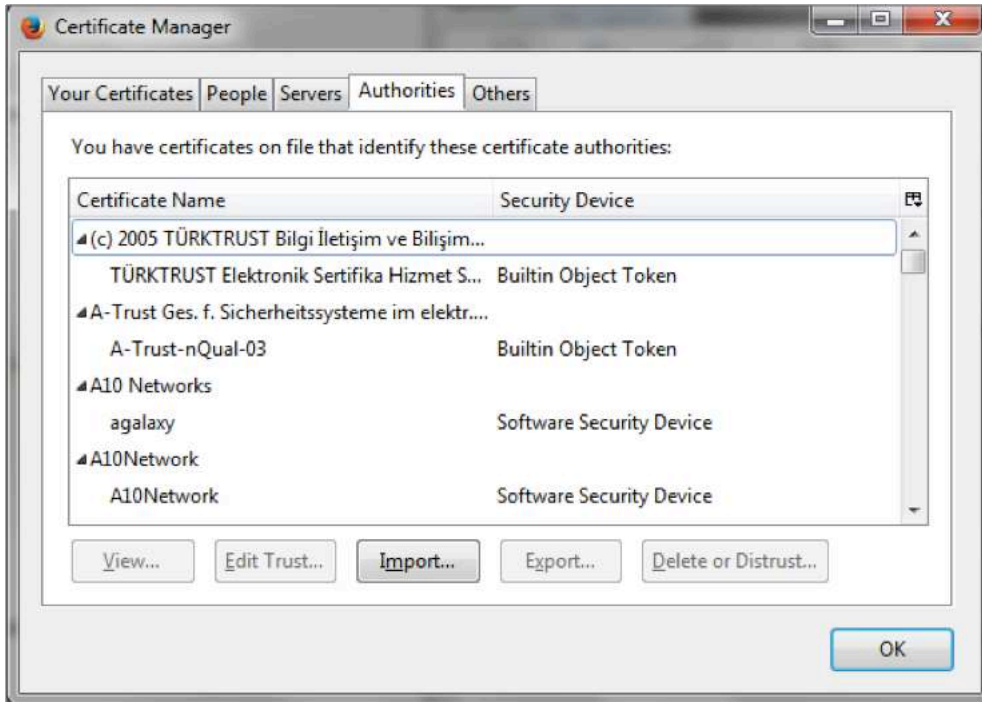
Installing a Certificate in Mozilla Firefox

Mozilla Firefox utilizes a certificate store and all root CA certificates are stored within the certificate store. In order for SSL Insight to perform properly, each client must download and install the SSL root certificate. Otherwise, Firefox will generate an error message warning clients about SSL error connection attempts.

1. To install a SSL root certificate in Firefox, launch the Firefox browser and open the **Options** window.



- From the Options window, select the **Advanced** settings option and then click the **Certificate** tab. From the **Certificates** window, click the **View Certificates** button. Mozilla will display the **Certificate Manager** dialog.



- Click the **Import** button.
- Navigate to where the certificate is located and click **Open**. A **Downloading Certificate** window will be displayed.



- Select the **Trust this CA to identify websites** checkbox and click **OK**. Now, the certificate should be imported and the client machine can access HTTPS applications without receiving an error message.

About A10 Networks

A10 Networks is a leader in application networking, providing a range of high-performance application networking solutions that help organizations ensure that their data center applications and networks remain highly available, accelerated and secure. Founded in 2004, A10 Networks is based in San Jose, California, and serves customers globally with offices worldwide. For more information, visit: www.a10networks.com

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